

Augmented Reality Based Word Translator

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Abstract— People travel to different places not knowing the language used in that region. Hence there is a need to translate these unknown words to recognizable text. This application is developed to help travelers who can get the translated text as an output of our application. Our application is able to recognize the text captured by a mobile phone camera, translate the text and display the translation result back onto the screen of the mobile phone in an augmented manner.

Index Terms— Android, Augmented Reality, Optical Character Recognition, Word Translator.

I. INTRODUCTION

The motivation of our application is to help tourist navigate in a foreign language environment. The application we developed enables the users to get text translated as easy as a button click. The camera captures the text and returns the translated result in the real time.

The system we developed includes automatic text detection, OCR and text translation. Although the current version of our application is limited to translation of a few languages, we can add a feature of text-to-speech, as an extension in our application.

II. EXISTING SYSTEM

Our application is inspired by WORD LENS, which is an application developed by Otavio Good, a former video game developer and the founder of Quest Visual, John DeWeese (worked for Electronic Arts, game Spore) and programmers Maia Good, Bryan Lin and Eric Park. WORD LENS was initially released for iOS, on Dec 16, 2010 (stable release on June 11, 2013). Word Lens is best used on clearly printed text and is not designed to translate hand-written or stylized fonts. Word Lens offers selected languages, provided the application users must purchase each language in order to have the required language translation. Our application will provide the users with regional languages (INDIAN) as well, along with foreign languages, at a cheaper rate. Word lens is basically

developed for iOS. The translation it provides is not always 100 percent accurate. It has a hit rate of 90-95 percent.



FIG 1: Output of word lens

The above figure depicts an example of the word lens application which translates the words “Bienvenido Al Futuro” to the desired English language, the output being, “Welcome to the future”.

III. PROPOSED SYSTEM

Inspired by the existing application, we will use the same concept.. We have made this application more user friendly by providing the user with a mean confidence about the output which gives the extent to which the output is right. This application will provide the users with regional languages (INDIAN), along with foreign languages. This application will be available for the users at a comparatively cheaper rate.

IV. EXPERIMENTAL STUDY.

A. Optical Character Recognition(OCR)

Optical Character recognition usually abbreviated to OCR is the mechanical or electronic conversion of scanned or photoed images of typewritten or printed text into machine-encoded/computer-readable text. There are several OCR softwares that have been developed to accomplish this mission. Tesseract, originally developed as proprietary software at Hewlett-Packard between 1985 and 1995, now sponsored by Google, is considered to be one of the most accurate open source OCR engine currently available. It is capable of recognizing text in variety of languages in a binary image format.

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B. Display Of Translation

Our result i.e. the translated text will be displayed in an overlapped manner in such a way that the result will give an augmented feel. The overall impact of the application is to provide a way to get the text translated using the concept of augmented reality.

C. Augmented Reality

Augmented reality (AR) is a live, copy, view of a physical, real-world environment whose elements are *augmented* (or supplemented) by computer-generated sensory input such as sound, video, graphics or GPS data. It is related to a more general concept called mediated reality, in which a view of reality is modified (possibly even diminished rather than augmented) by a computer. As a result, the technology functions by enhancing one's current perception of reality. By contrast, virtual reality replaces the real world with a simulated one. Augmentation is conventionally in real-time and in semantic context with environmental elements.

Applications of Augmented Reality:

- 1) Medical
- 2) Gaming
- 3) Office workplace
- 4) Industrial design
- 5) Defense
- 6) Sports and entertainment
- 7) Navigation



Fig 2: Application of augmented reality.



FIG 3: Window's Nokia city lens



FIG 4: BlackBerry's ARKick

IV. ADVANTAGES AND CONSTRAINTS

Advantages:

- 1) Text will be translated to desired language.
- 2) Quick results will be obtained.
- 3) Real-time translation.
- 4) User-friendly.

The output of the application will be received in the selected language. The results obtained will be very quick with negligible delay. The translations will be dynamic. This application is very easy to use.

Constraints:

- 1) The text to be scanned and translated should be clear enough to get detected by the phone's camera.
- 2) The RAM should be considerably free.
- 3) Text to be translated must not be running/cursive.
- 4) The environment should be bright enough for the camera to detect the text.
- 5) Camera clarity should be good enough for the detection of text to be translated.

The key requirement of the application is that the text(that is to be translated) should be clear enough else the application will not be able to detect it. The distance between the phone and the text will not matter as long as the

text is clear . If the RAM of the phone is not free enough, the processing time might increase leading to delay in output.

V. FUTURE ENHANCEMENTS

This application can be extended to include a module of text to speech translation where the output will be in the form of translated text along with corresponding speech. We can also include an additional module where the application will be able to detect the traffic signs and symbols and display their corresponding meanings.

VI. CONCLUSION

From our study we come to know that AR has emerged as a revolutionary technology in the past decade. It has a huge scope for applications in various fields. Android too being the latest and emerging technology, uses few applications based on Augmented Reality, one of them being camera-based text translation. Hence, the application we are making will have a wide scope in future, which will be available for android smartphone users.

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